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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification ⁶ : A01M 1/20, 1/24, 21/00, A01N 25/34, E01H 11/00, E04B 1/72, B32B 5/00, 33/00</p>	<p>A1</p>	<p>(11) International Publication Number: WO 97/47190 (43) International Publication Date: 18 December 1997 (18.12.97)</p>
<p>(21) International Application Number: PCT/IB97/00583 (22) International Filing Date: 22 May 1997 (22.05.97) (30) Priority Data: PO 0372 11 June 1996 (11.06.96) AU (71) Applicants (for all designated States except US): HOECHST SCHERING AGREVO PTY. LIMITED [AU/AU]; 1731- 1733 Malvern Road, Glen Iris, VIC 3146 (AU). AGREVO UK LIMITED [GB/GB]; Hauxton, Cambridge CB2 5HU (GB). (72) Inventors; and (75) Inventors/Applicants (for US only): MORROW, Philip, McLaughlin [AU/AU]; 9 Kelly Close, Baulkham Hills, NSW 2153 (AU). GLOVER, Andrew, John, Alexander [AU/AU]; 11 Havilah Avenue, Wahroonga, NSW 2076 (AU). FRASER, Gregory, Stuart [AU/AU]; 43 Catalpa Crescent, Turramurra, NSW 2074 (AU). FEEZ, Anthony, Mowbray [AU/AU]; 14 Bruckner Street, The Gap, QLD 4061 (AU). CRAMPTON, Peter, Leslie [GB/GB]; 18 Mulberry Close, Tring, Herts GP23 5DZ (GB).</p>	<p>(74) Common Representative: AGREVO UK LIMITED; Sewell, R., C., Patent Dept., Chesterford Park, Saffron Walden, Essex CB10 1XL (GB). (81) Designated States: AU, BG, BR, CA, CN, IL, JP, KR, MX, SG, TR, US, VN, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published With international search report.</p>	
<p>(54) Title: PESTICIDAL BARRIER</p> <div data-bbox="438 1071 1396 1344"> </div> <p>(57) Abstract</p> <p>The invention relates to a laminar pesticidal barrier (1) for covering the ground beneath a building or cultivated area comprising an upper portion (3) and a lower portion (4) each of which comprises a layer substantially impermeable to pesticide, and a foraminous pesticide-containing layer (2) between said portions.</p>		

Pesticidal BarrierTechnical Field

- 5 The invention relates to pesticidal barriers and particularly to dual-purpose
pesticidal-moisture barriers for use in the construction industry for protecting
building foundations from subterranean attack from pests and moisture,
particularly termites. However the invention is not intended to be limited to the
construction industry, but also finds utility in any situation where the entry of
10 pests need preventing across a large area, for example cultivated areas in
agriculture and horticulture. In addition, the invention is not intended to be limited
to termites, but forms an effective barrier to other pests such as weeds, fungi,
insects and the like, when used in conjunction with a suitable pesticide.

15 Background Art

- In many countries of the world, particularly in tropical and sub-tropical regions,
buildings are susceptible to attack from subterranean pests, especially termites. In
such countries it is prudent to take preventative action to prevent pests entering
buildings. Such preventative action involves creating a barrier, typically a
20 pesticidal barrier, to prevent access of the pest.

- It is both more convenient and more effective if such a barrier is created prior to
construction such that it covers the area underneath the building including its
footings. For a number of years it has been commonplace to create pesticidal
25 barriers by spraying high doses of toxic and/or persistent pesticides, particularly
organophosphate and organochlorine compounds directly into the ground beneath
the building prior to construction. However, this practice results in environmental
contamination, food chain entry and bio-accumulation, and its practice is forbidden
in a number of countries.

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A number of attempts have been made to reduce the environmental damage
caused by the above-mentioned pesticidal barriers. For example, WO 90/14004
(Sapsford) describes a method of creating a pesticidal barrier prior to building
construction which comprises lining a building excavation with a fibrous blanket

termites, and therefore rather than deterring pests away from the barrier may actually attract them.

5 A further problem with all of the abovementioned pesticidal barriers is the requirement to use protective clothing to limit exposure of the construction worker to the pesticide, when laying a pre-impregnated blanket or when spraying.

10 We have now developed a simple yet ingenious invention which in addition to addressing the above mentioned problems, also provides a more effective barrier to termites.

Disclosure of Invention

15 According to an aspect of the invention there is provided a laminar pesticidal barrier for covering the ground beneath a building or cultivated area comprising, an upper portion and a lower portion each of which comprises a layer substantially impermeable to pesticide, and a pesticide-containing layer between said portions, characterised in that the pesticide-containing layer is foraminous.

20 It will be appreciated that the invention functions as an effective pesticidal barrier in any orientation. For example the barrier can be situated vertically to prevent pest ingress from the side or lain horizontally to prevent pest ingress from beneath. Typically however the barrier will be used to completely line an excavation, such as a trench. In this instance the barrier prevents pest ingress from beneath and from the side. For the purposes of conciseness therefore the
25 term "upper portion" refers to the portion of the blanket between the pesticide-containing layer and the building footings, and the term "lower portion" refers to the portion of the barrier between the pesticide-containing layer and the ground.

30 We have found that pesticidal barriers made in accordance with the invention provide a number of advantages over prior art pesticidal barriers.

In the unlikely event that pests breach the lower portion of the barrier, the foraminous nature of the pesticide-containing layer will prevent progress of other pests across the barrier. During tests we have discovered that pests, particularly

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may attract other pests, such as termites. We have found that our invention also performs as an effective moisture barrier. Thus, in a preferred embodiment at least one of the upper or lower portions is impermeable to moisture.

5 As mentioned above, our invention finds particular utility in the construction industry because of its dual role as a pesticide / moisture barrier. The barrier is typically lain underneath a building prior to the laying of the concrete foundations which are built directly on top of the barrier. Accordingly it is important that the upper portion of the barrier is sufficiently robust to withstand the construction of
10 the building foundations. Therefore, in a preferred embodiment the upper portion of the barrier is more resistant to rupture than the lower portion. In a preferred example, resistance to rupture of the upper portion may be achieved by increasing its thickness relative to the lower portion. Preferably the upper portion is between 150 and 250 microns thick and the lower portion is between 75 and 125 microns
15 thick.

We have found it convenient for both upper and lower portions each to consist of a single layer which combines the above mentioned properties of being impermeable to pesticide, and/or moisture, and/or resistant to rupture. Therefore
20 in a preferred embodiment the upper and lower portions are polyethylene.

Plastic materials such as polyethylene are known to degrade when exposed to sunlight which may be a problem when pesticidal barriers according to the invention are stored outdoors for significant periods. Therefore we have found it
25 advantageous to provide at least one of the upper or lower polyethylene portions with a UV stabiliser.

The term foraminous when applied to the foraminous layer is intended to include any material which contains passageways. Examples of suitable foraminous layers
30 are woven materials, sponges and foams. Preferably the foraminous material is a fibrous mat wherein the fibres are from 4 to 8 denier and the fibre crossing points are 100 microns apart, and wherein the average void volume of the mat is 85% at 10 kPa.

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containing-layer of our invention to prevent fungal growth therein, thereby reducing the likelihood that termites will be attracted to the barrier. Particularly effective fungicides include the azole group of fungicides, such as prochloraz, cyproconazole, propiconazole, tebuconazole, azaconazole or carbendazim.

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As mentioned above the pesticidal barrier is not limited solely to use as an insecticide or termiticide barrier. For example, when the pesticide-containing layer contains a herbicide, weeds will be prevented from passing through the barrier. Such a herbicidal barrier finds utility in the production of turf, when lain beneath

10 turf the barrier will prevent weeds passing through the barrier and contaminating the turf. In similar fashion, the invention finds utility as a barrier to fungi and moulds when the pesticide-containing layer contains a fungicide. Particularly effective fungicides include the azole group of fungicides, such as prochloraz, cyproconazole, propiconazole, tebuconazole, azaconazole or carbendazim.

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The invention is also directed to methods for installing and manufacturing the pesticidal barrier. Such methods would be readily apparent to a skilled person.

Brief Description of Drawing

20 The invention will now be described by way of example only with reference to the following figures.

Figure 1 shows a side-sectional view of a laminar pesticidal barrier in position prior to laying foundations for a building.

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Referring to Figure 1 there is shown a laminar pesticidal barrier 1. Barrier 1 comprises a pesticide-containing layer 2 and upper and lower portions 3 and 4 respectively. The edges of barrier 1 show both upper and lower portions extending beyond pesticide-containing layer 2 (layers 3 and 4 are depicted separated at the

30 right hand edge of the barrier to enhance clarity). Pesticide-containing layer 1 is preferably a mat of fibre. Preferred fibres are synthetic such as nylon, polypropylene and titanium dioxide.

CLAIMS

- 1 A laminar pesticidal barrier (1) for covering the ground beneath a building or
cultivated area comprising, an upper portion (3) and a lower portion (4)
5 each of which comprises a layer substantially impermeable to pesticide,
and a pesticide-containing layer (2) between said portions, characterised in
that the pesticide-containing layer is foraminous.
- 2 A laminar pesticidal barrier according to claim 1 wherein the foraminous
10 pesticide-containing layer (2) is flexible.
- 3 A laminar pesticidal barrier according to any preceeding claim wherein the
foraminous pesticide-containing layer (2) comprises synthetic material.
- 15 4 A laminar pesticidal barrier according to any preceding claim wherein at
least one of the upper and lower portions (3 or 4) is impermeable to
moisture.
- 5 A laminar pesticidal barrier according to any preceding claim wherein the
20 upper portion (3) is more resistant to rupture than the lower portion (4).
- 6 A laminar pesticidal barrier according to any preceding claim wherein the
upper portion (3) is between 150 and 250 microns thick and the lower
portion (4) is between 75 and 125 microns thick.
- 25 7 A laminar pesticidal barrier according to any preceding claim wherein the
upper and lower portions (3 and 4) are fabricated from polyethylene.
- 8 A laminar pesticidal barrier according to claim 7 wherein at least one of the
30 polyethylene portions (3 or 4) contains a UV stabiliser.
- 9 A laminar pesticidal barrier according to any preceding claim wherein the
pesticide-containing layer (2) is a fibrous mat.

- 21 A laminar pesticidal barrier including an inner layer (2) formed from a material that is capable of holding a pesticide and upper (3) and lower (4) outer layers that are arranged and adapted to prevent contact with the
- 5 inner layer (2) wherein the inner layer is a woven, foraminous and fibrous mat.

INTERNATIONAL SEARCH REPORT

 International Application No.
PCT/IB 97/00583

A. CLASSIFICATION OF SUBJECT MATTER		
Int Cl ⁶ : A01M 1/20, 1/24, 21/00; A01N 25/34; E01H 11/00; E04B 1/72; B32B 5/00, 33/00		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols) IPC ⁶ : A01M 1/20, 1/24, 21/00; A01N 25/34; E01H 11/00; E04B 1/72; B32B 5/00, 33/00		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched AU: IPC as above		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	AU 62329/90 A (TRIM) 14 March 1991. See page 5 line 10 to page 6 line 30	1, 21
X	AU 32834/93 (662035) B (CASA BERNARDO LTDA) 18 August 1994 See figure 2	1, 21
Y	GB 2098541 A (CALIGEN FOAM) 24 November 1982 See claims 8, 21 and 38	1
X		21
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C <input checked="" type="checkbox"/> See patent family annex		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "I" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance, the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 20 June 1997		Date of mailing of the international search report 24 JUN 1997
Name and mailing address of the ISA/AU AUSTRALIAN INDUSTRIAL PROPERTY ORGANISATION PO BOX 200 WODEN ACT 2606 AUSTRALIA Facsimile No.: (06) 285 3929		Authorized officer DAVID LEE <i>DL</i> Telephone No.: (06) 283 2107

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No.

PCT/IB 97/00583

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report	Patent Family Member
GB 2098541	NONE
WO 90/14004	AU 56607/90
AU 52454/96	NONE
AU 48655/90	NONE
JP 01-058739	NONE
US 4929497	AT 93573 AU 49287/90 BR 9000817 CA 2012353 EP 390428 ES 2043272 JP 03-047391
US 4666767	AR 198257 AT 9340/73 AU 61087/73 BE 807146 B4 7308751 CA 1025770 DE 2356155 ES 419946 FR 2206051 GB 1391248 IL 43309 IN 140712 IT 999741 JP 49-079859 JP 58-032944 NL 7315293 TR 18172 ZA 7307999 US 4160335 US 4639393
WO 95/18532	AU 13886/95 CN 1142745 EP 738108 FR 2714685
AU 82443/01	NONE
AU 16163/95	NONE
END OF ANNEX	